

REMARKS

The specification has been amended to indicate that Example 5A is not a comparative example, but rather an example according to the present invention. In addition, a typographical error in the table at page 71, line 25 was corrected. No new matter has been added.

The Office Action of December 27, 2004, has been reviewed and the Examiner's comments have been carefully considered. Claims 1, 2, 4-22, 24-28, 30-49, and 57-114 are pending in the application.

Restriction Requirement

The Examiner has indicated that the pending claims are subject to a restriction requirement. Specifically, the Examiner suggested that there are five distinct groups of claims, namely Group I, claims 1, 2, 4-22, 24-28, and 30-49, drawn to an electrocoating process, classified in class 204, subclass 471+; Group II, claims 57-79, drawn to a multi-layer composite coating composition, classified in class 428, subclass 462; Group III, claims 80-97, drawn to a process for coating a metal substrate, classified in class 204, subclass 471+; Group IV, claims 98-111, drawn to a curable coating composition, classified in class 428, subclass 462; and Group V, claims 112-114, drawn to an electrocoating process, classified in class 204, subclass 471+. Applicants thank the Examiner for indicating that the inventions of the various groups are patentably distinct from each other. However, the Applicants respectfully traverse the restriction for the following reasons.

The Examiner asserts that Groups I and III are unrelated in that they have different functions. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group III recites a specific embodiment of the subject matter of Group I. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different functions. Contrary to the Examiner's assertion, the function of both processes is to coat a substrate and yield a coating that has improved adhesion properties.

The Examiner asserts that Groups I and IV are unrelated in that they have different effects. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group IV recites a specific coating composition that is encompassed in scope and may be used in the process of Group I. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different effects. Contrary to the Examiner's assertion, the effect of the process of Group I is to coat a substrate and yield a coating that has improved adhesion properties, which may be achieved using the coating composition of Group IV.

The Examiner asserts that Groups I and V are unrelated in that they have different functions. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group V recites a specific embodiment of the subject matter of Group I. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different functions. Contrary to the Examiner's assertion, the function of both processes is to coat a substrate and yield a coating that has improved adhesion properties.

The Examiner asserts that Groups II and III are unrelated in that they have different effects. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group II recites a specific coating composition that may be used in the process of Group III. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different effects. Contrary to the Examiner's assertion, the effect of the process of Group III is to coat a substrate and yield a coating that has improved adhesion properties, which may be achieved using the coating composition of Group II.

The Examiner asserts that Groups II and IV are unrelated in that one Group specifies a partially blocked aliphatic polyisocyanate curing agent while the other specifies a cationic salt-group containing resin. The Examiner is thanked for

indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Groups II and IV are related as combination-subcombination. The invention recited in the claims of Group II include the particulars of Group IV.

The Examiner asserts that Groups II and V are unrelated in that they have different effects. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group II recites a specific coating composition that may be used in the process of Group V. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different effects. Contrary to the Examiner's assertion, the effect of the process of Group V is to coat a substrate and yield a coating that has improved adhesion properties, which may be achieved using the coating composition of Group II.

The Examiner asserts that Groups III and IV are unrelated in that they have different effects. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Group IV recites a specific coating composition that is encompassed in scope and may be used in the process of Group III. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different effects. Contrary to the Examiner's assertion, the effect of the process of Group III is to coat a substrate and yield a coating that has improved adhesion properties, which may be achieved using the coating composition of Group IV.

The Examiner asserts that Groups III and V are unrelated in that they have different functions. The Examiner is thanked for indicating that the subject matter of each group is patentably distinct from the other. However, Applicants submit that the subject matter of Groups III and V recite different embodiments of the present invention. It is noted by the Examiner that in order for inventions to be unrelated, it must be shown that they have different functions. Contrary to the Examiner's

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assertion, the function of both processes is to coat a substrate and yield a coating that has improved adhesion properties.

In view of the arguments presented above, Applicants respectfully request reconsideration and withdrawal of the restriction requirement

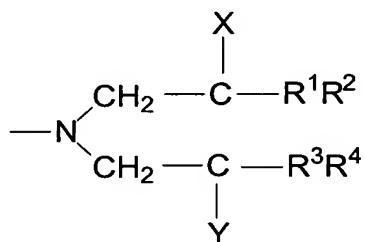
Rejections

Claims 1, 2, 4-22, 24, 26-28, and 30-48 were rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2000-281943A in view of Corrigan et al. and either Faul et al. (US 5,258,460) or Schupp et al. (US 5,096,555). The Examiner asserts that the Japanese reference discloses a high weatherability electrodeposited paint composition and method, comprising all the steps as claimed. The Examiner concedes that the reference is deficient in that there is no teaching of terminal or pendant amino groups on the polymeric backbones. The Examiner relies on either Faul or Schupp for a teaching of terminal and pendant amino groups on electrodepositable resins, and concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Japanese reference's teachings as suggested by either Faul or Schupp because the selection of any of known equivalent cationic amine salt group-containing resins would have been within the level of ordinary skill in the art.

The Examiner relies on Corrigan for a teaching of heating done by any convenient method such as by baking in ovens or with banks of infrared heat lamps. The Examiner concludes that the selection of any of known equivalent heatings would be within the level of ordinary skill in the art.

Applicants respectfully disagree with the Examiner's rejection and conclusions regarding the above claims. Applicants submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). If one were to combine the whole teachings of the Japanese reference, and Schupp or Faul with the whole teaching of the Corrigan reference, one would not arrive at the present invention as claimed.

The present invention is drawn to an improvement to a process for coating an electroconductive substrate, the improvement comprising the presence in the curable electrodepositable coating composition of one or more cationic amine salt group-containing resins wherein the amine salt groups are derived from pendant and/or terminal amino groups having the following structure:



wherein R^1 , R^2 , R^3 , and R^4 are the same or different, and each independently represents H or C₁ to C₄ alkyl; and X and Y can be the same or different, and each independently represents a hydroxyl group or an amino group; and wherein the coated substrate formed in step (a) is heated in a curing oven in the presence of NO_x in a range of 5 parts per million or less to a temperature and for a time sufficient to cure the electrodeposited coating on the substrate. The resultant coating exhibits substantially no interlayer delamination between the cured electrodeposited coating and the cured top coat upon concentrated solar spectral irradiance exposure.

“It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” *In re Wesslau*, 353 F.2d 238, 241, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). See also MPEP §2141.02: “[a] prior art reference must be considered in its entirety, i. e., as a whole, including portions that would lead away from the claimed invention.” If the references are considered each in their entirety, the teachings of the Japanese reference combined with either Schupp or Faul and Corrigan teach away from the present invention. As mentioned earlier, the Japanese reference discloses a high weatherability electrodeposited

paint composition and method. Schupp and Faul demonstrate terminal and pendant amino groups on electrodeposable resins. Corrigan discloses an electrodeposable primer composition having improved delamination resistance. The improved delamination resistance of Corrigan is due to the presence of hindered amine light stabilizers (HALS) in the composition, which is the essence of Corrigan's invention. If one were to combine all the references after considering them in their entirety, in order to develop a process for coating an electroconductive substrate with an electrodeposable coating composition having improved delamination resistance, one skilled in the art would be compelled to use a cationic resin in combination with HALS as taught by Corrigan. One would not pick and choose particular curing methods to improve delamination resistance or for any other reason because none of the references considered in their entirety offer any reason to do so.

None of the references, taken alone or in any combination, teach or suggest the method of the present invention, i. e., a method of coating an electroconductive substrate using the composition recited above, including the step of heating in a curing oven in the presence of NO_x in a range of 5 parts per million or less, as recited in the instant claims. In fact, the references are silent on the method of heating the substrate during cure because no advantages are recognized by the references of the use of a low NO_x atmosphere. In contrast, in the process of the present invention, there is a distinct advantage noted to heating the substrate in a low NO_x atmosphere. As shown in Table 1 of the Specification and in amended Table 2, there are marked improvements in adhesion, in particular intercoat adhesion for coatings cured in an electric (low NO_x) oven compared to a gas oven, in processes of the present invention.

Regarding the Corrigan reference, Corrigan assumes that bake ovens and infrared heat lamps are equivalent. However, on page 42, lines 22-25 of the present specification, it is noted: "The presence of NO_x in the curing ovens can create an oxidizing atmosphere which can result in interlayer delamination between the cured electrodeposited coating and any subsequently applied top coats upon weathering exposure." This observation and other examples of adhesion loss due to NO_x are

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demonstrated in the data shown in Tables 1 and 2, referred to above, and further explained in the attached declaration of Robert R. Zwack. There is no teaching or suggestion in any of the references, taken alone or in any combination, to use a low NO_x environment during curing of electrodeposited coatings as is contemplated by and claimed as the present invention. While Corrigan notes several alternative methods of cure, they are assumed by Corrigan to be equivalent and no appreciation for the unexpected adhesion results obtained by the process of the present invention is apparent. Corrigan teaches the use of HALS for improved adhesion. One would not be led by a reading of Corrigan to modify the process of the Japanese reference or any of the other references by curing with infrared lamps because no advantages of doing so are offered by Corrigan.

Claims 25 and 49 were rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2000-281943A in view of either Faul et al. or Schupp et al. and Corrigan as above, and further in view of Armstrong. The Examiner relies on Armstrong for a teaching of the use of yttrium in an electrodeposition process. The Examiner concludes that “the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references’ teachings as suggested by Armstrong because this would result in a coated substrate with high resistance to corrosion.”

Applicants respectfully disagree with the Examiner’s rejection and conclusions regarding claims 25 and 49. Armstrong does nothing to overcome the fundamental deficiencies of other references in teaching the present invention. There is no teaching or suggestion in Armstrong that heating in a low NO_x atmosphere would be effective for improving adhesion of an electrodeposited coating composition. The references taken alone or in combination fail to teach the method of the present invention.

It is believed that Applicants’ claims are patentable over the prior art. None of the references, taken alone or in any combination, teach or suggest a process for coating an electroconductive substrate as is recited in the present claims.

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CONCLUSION

For the reasons given above, it is respectfully submitted that the present response overcomes all of the prior art of record. A Notice of Allowance is respectfully.

Respectfully submitted,

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